

IN THE CLAIMS:

1. (Original) A mass flow controller, which has a flow rate control valve and a flow rate sensor, characterized by comprising a pressure control valve disposed at the upstream side of the flow rate control valve, a pressure sensor disposed between this pressure control valve and the flow rate control valve, and a controller for controlling the pressure control valve by feeding back the output of this pressure sensor.

2. (Original) The mass flow controller according to claim 1, wherein the pressure sensor faces to the passage immediately before the flow rate sensor.

3. (New) A mass flow controller module that can control fluid flow and be installed as a unitary component, comprising:

a housing block member having a fluid passageway, mounted on the housing block member from an upstream position is a pressure control valve unit, a flow rate sensor unit and a flow rate control valve unit;

a pressure sensor unit operatively mounted in the fluid passageway; and
a control unit operatively connected to the pressure control valve unit, the flow rate sensor unit, the flow rate control valve unit and the pressure sensor unit whereby the control unit can automatically set and maintain a constant flow rate despite changes in fluid pressure.

4. (New) The mass flow controller module of claim 3 wherein a second pressure sensor unit is mounted between the pressure control valve and the flow rate sensor and operatively connected to the control unit.

5. (New) The mass flow controller module of claim 3 wherein the pressure control valve unit, flow rate sensor unit and flow rate control valve unit are respectively mounted adjacent each other on fluid openings on the housing block member including a pressure control valve seat and a flow rate control valve seat.

6. (New) The mass flow controller module of claim 3 further including a filter member mounted in the housing block member fluid passageway upstream of the pressure control valve unit.

7. (New) The mass flow controller module of claim 3 wherein the housing block member has a non-linear fluid passageway with openings to the passageway on an upper surface, the openings including a first annular valve seat for operatively interfacing with a diaphragm member of the pressure control valve unit, a pair of ports for connection to the flow rate sensor unit and a second annular valve seat for operatively interfacing with a diaphragm member of the flow rate control valve.

8. (New) The mass flow controller module of claim 7 wherein the openings to the fluid passageway are aligned in a row adjacent each other across the housing block member.

9. (New) In a semiconductor production assembly utilizing a source of fluid, the improvement of a mass flow controller module that can control fluid flow and be installed as a unitary component, comprising:

a housing block member having a fluid passageway connected to the source of fluid, mounted on the housing block member from an upstream position is a pressure control valve unit, a flow rate sensor unit and a flow rate control valve unit;

a pressure sensor unit operatively mounted in the fluid passageway; and

a control unit operatively connected to the pressure control valve unit, the flow rate sensor unit, the flow rate control valve unit and the pressure sensor unit whereby the control unit can automatically set and maintain a constant flow rate despite changes in fluid pressure.

10. (New) The semiconductor assembly of claim 9 wherein a second pressure sensor unit is mounted between the pressure control valve and the flow rate sensor and operatively connected to the control unit.

11. (New) The semiconductor assembly of claim 9 wherein the pressure control valve unit, flow rate sensor unit and flow rate control valve unit are respectively mounted adjacent each other on fluid openings on the housing block member including a pressure control valve seat and a flow rate control valve seat.

12. (New) The semiconductor assembly of claim 9 further including a filter member mounted in the housing block member fluid passageway upstream of the pressure control valve unit.

13. (New) The semiconductor assembly of claim 9 wherein the housing block member has a non-linear fluid passageway with openings to the passageway on an upper surface,

the openings including a first annular valve seat for operatively interfacing with a diaphragm member of the pressure control valve unit, a pair of ports for connection to the flow rate sensor unit and a second annular valve seat for operatively interfacing with a diaphragm member of the flow rate control valve.

14. (New) The semiconductor assembly of claim 9 wherein the openings to the fluid passageway are aligned in a row adjacent each other across the housing block member.